

## ABSTRACT

1           An improved computer memory subsystem determines the most efficient  
2       memory command to execute. The physical location and any address  
3       dependency of each incoming memory command to a memory controller is  
4       ascertained and that information accompanies the command for categorization  
5       into types of command. For each type of memory command, there exists a  
6       command FIFO and associated logic in which a programmable number of the  
7       memory commands are selected for comparison with each other, with the  
8       memory command currently executing, and with the memory command  
9       previously chosen for execution. The memory command having the least  
10      memory cycle performance penalty is selected for execution unless that memory  
11      command has an address dependency. If more than one memory command of  
12      that type has the least memory cycle performance penalty, then the oldest is  
13      selected for execution. Memory commands of that type are selected for  
14      execution each subsequent cycle until a valid memory command of that type is  
15      no longer available, or until a predetermined number has been executed, or until  
16      a memory command of another type has higher priority. If an address  
17      dependency exists between memory commands of different types, then memory  
18      commands of the same type of the oldest memory command is executed to  
19      avoid deadlock.